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ABSTRACT

"This Fragile Earth" is the theme portrayed in this newsletter from the Wisconsin Department of Public Instruction. Since we are being faced with the problem of survival because of the deterioration of the environment, it is suggested that the fragile quality of the environment can serve as a means of impressing upon young people their responsibilities for stewardship of their environment. To this end, several articles address themselves to various facets of the whole topic of environmental education and the spirit of stewardship. "Transforming Man's Attitude Toward the World" is the lead article by Sen. Gaylord Nelson, relating several ramifications of the Environmental Education Act of 1970. Other writings deal with science, social studies, aesthetics, and math in the environment and in environmental education. Curriculum development is explored in two articles, "Environmental Education: An Action Model," and "Improving Wisconsin High School Conservation Courses." One additional story characterizes a school site for environmental education at the Forest Park Outdoor Education Center, Franklin, Wisconsin. Miscellaneous items of local interest complete the newsletter. (BL)

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NEWSLETTER

THE WISCONSIN DEPARTMENT
OF PUBLIC INSTRUCTION

December 1970

THIS FRAGILE EARTH

SE 012 577

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The Newsletter

Vol. 24, No. 4

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THIS FRAGILE EARTH

from the state superintendent

The *Newsletter* this month has a very timely theme, "This Fragile Earth." It is somewhat paradoxical that in a period of our history that can generally be characterized as affluent, we are also faced with the problem of survival because of the deterioration of the environment. Several articles in this month's *Newsletter* address themselves to various facets of the whole topic of environmental education. Ideally, perhaps, we might see environmental education as a general theme around which much of the school program could be organized. For example, we have had excellent response to the mathematics bulletin concerning pollution which was published by the Department a few months ago. The article in this bulletin having to do with art and its relationship to the environment suggests ways for using this topic as a rallying point around which much of the art curriculum can be organized. All such efforts to highlight the importance of the environment are excellent vehicles to carry the message to our youth. We must not lose sight, however, of the most desirable outcome of all our efforts in environmental education.

I would like to suggest that the fragile quality of the environment can serve as a means of impressing upon young people their responsibilities of *stewardship* while they play their role upon the world's stage. Each generation must be helped to understand its place in the march of history. Not only must each citizen comprehend what has gone on before, but he must also recognize his responsibility to those who will follow. It is the responsibility of the school to help young people understand that they play only a part in a passing scene. It is fitting and proper in this month when we celebrate Christmas, which is a time for giving, that we pay some attention to this whole matter of our stewardship of the things which we have been given and which the next and succeeding generations must also have if they are to survive.

I am convinced that the ingenuity of man will make it possible to solve the problems of pollution and of renewing the air and the water and other natural resources so that succeeding generations can live in happiness. What concerns me, however, is whether or not we are sufficiently imbued with a sense of stewardship to provoke us to action before it is too late.

In too many instances individuals are motivated by a sense of "I'll get mine — let the other fellow get his." Young people can be helped to understand that each person has a responsibility to assure the continuation of this fragile earth.

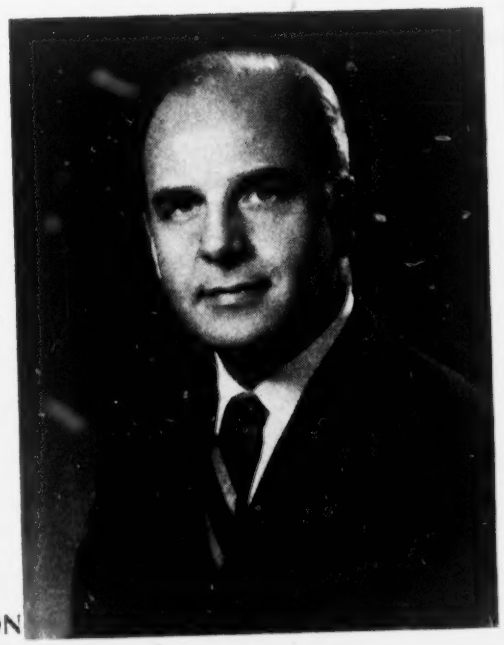
If this *spirit of stewardship* can be engendered in our young people, the means for doing the job will follow. Without the desire and without the spirit, however, the earth is indeed most fragile.

William C. Kahl

State Superintendent

"TRANSFORMING MAN'S ATTITUDE TOWARD THE WORLD"

Environmental
Education Act
The Law of the Land



SEN. GAYLORD NELSON

ENVIRONMENTAL education has as its goal nothing less than transforming man's attitude toward the world in which he lives. It attempts to make him aware that he is not at the pinnacle of existence, but an integral part of the earth's closed life system—that he is related to all other living creatures, and the earth's land, air and water are not a background to be exploited but resources to be cherished and nurtured for future generations.

This is an immense task, but not an impossible one. Earth Day, held last April, was a major step in a nationwide effort to focus public attention on the crisis of the environment. It was a remarkable success and gave great momentum to the environmental cause. Now we must create Earth Week as an annual event.

Another major breakthrough in the crucial battle for public awareness is the signing into law of a bill intended to make every day of the year an environmental teach-in day.

The bill is the Environmental Education Act, which Congressman Brademas of Indiana and I introduced a year ago, and which became the law of the land on November 1. It will initiate a broad program of environmental education, designed to make more effective use than ever before of the environment as a teaching resource. The legislation will help to develop new teaching techniques and curricula and help to make ecology a meaningful concept to children and adults alike.

Specifically, the bill authorizes the U.S. Commissioner of Education to develop a national environmental education program, from preschool through graduate, adult, and community education levels. The program will include curriculum development and teacher training.

The legislation will establish fellowships for teachers and teacher trainees on the elementary, secondary, college and graduate level, enabling them to attend university summer sessions to learn techniques for teaching environmental education subjects. Other preservice and

inservice training programs to be established include institutes, workshops, symposiums, and seminars.

Too often, elementary and secondary school teachers are uncomfortable with the thought of using the outdoors as a classroom. The implementation of new techniques will help break down this barrier so that man, technology and nature can be perceived as an integrated, interrelated whole.

At the secondary and undergraduate level, the new teaching will emphasize a problem-solving approach. Students will be encouraged to go out into the field and look at pollution first-hand. As an example, elementary school children might start with the science phase of a pollution problem. They will ask, what has happened chemically or physically? Next, they proceed to the technology phase. They ask, what can be done to prevent or reduce the pollution? Then come the economic and political aspects. Is it economically and politically feasible to make the change?

This approach will give the student a total view of the problem, sharpen his sense of inquiry and contribute useful data and recommendations to government agencies and private industry.

The purpose of the graduate level program will be primarily to step up the professionalization of ecology as a discipline.

Education is the most effective means available to us of changing values and attitudes to create a new environmental citizenship, in which man will come to understand his role and responsibility as a custodian of life on this earth.

Gaylord Nelson
U.S.S.

EUROPE LAKE WITH WASHINGTON ISLAND NORTHWARD

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THIS MONTH'S COVER

"Walking where only a handful of men have walked in the history of the world."

Woodrow Wilson Sayre, now chairman of the philosophy department at Springfield College, Springfield, Mass., is seen belaying a Swiss companion up the North Col crevasse on the North Face of Mt. Everest, Tibet, during their spectacular assault on the world's highest mountain, in 1962. Sayre's account of the first (unofficial) American expedition to Everest is published in *Four Against Everest* (Prentice-Hall, 1964), already a classic in mountaineering literature. The photographs and the excerpt below are reprinted through the courtesy of the author and publisher.

WOODROW WILSON SAYRE

A vigorous outdoorsman who was deeply concerned about the destruction of man's environment long before it became a fashionable cause, Sayre is a member of one of America's most distinguished families and is the grandson of President Woodrow Wilson.

After having climbed many of the world's great peaks, including Alaska's Mt. McKinley, Sayre, along with a lawyer friend, a school teacher and a geology student, set out to attack the as yet unconquered North Face of Everest, which lies across the Nepalese border in Chinese-controlled Tibet.

In order to gain permission to climb, the four-man team had to persuade the Nepalese government that they were going to climb on a lesser Himalayan peak, within its national borders. The hazards of the Everest trip included a 185-mile "walk in" to base camp, as well as possible capture by Chinese patrols. Without Sherpas or other porters after base camp, the four men carried every ounce of supplies needed for forty days. Not even bottled oxygen, considered by most climbers a necessity, was taken. Hard luck, near-starvation and a streak of bad luck made the party turn back shortly before the summit had been reached, but not before they enjoyed one of the great adventures of our time.

Sayre closed *Four Against Everest* with a chapter, "Why Men Climb," that puts to rest timeworn cliches about "because it is there." "Not very far from my home," says Sayre, "is an impressive pile of junk called the town dump. It also is 'there,' and yet I have no desire at all to climb it. So something more than there-ness is needed as a reason for climbing."

In describing the reasons why he climbs mountains, Professor Sayre hits upon several reasons why even those of us who balk at climbing three flights of stairs should bend every effort to preserve what is left of the wilderness.

> First on my list . . . I would mention beauty. There are the colors: black rock and ultramarine shadows, pure white swell of snow, turquoise and amethyst crevasses,

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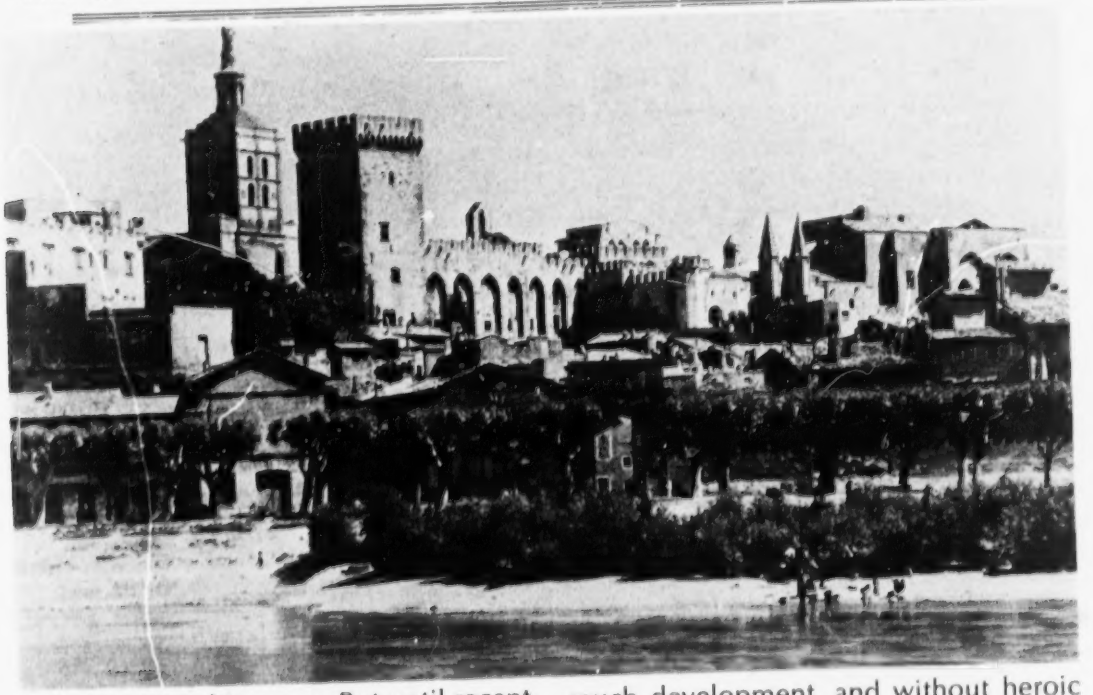
and the diamond glitter of sun on ice. In the afterglow of sunset the air itself becomes pink and gold. And there are the infinite clean shapes: wind-carved snow, fluted ice, weathered stone, and cloud-brushed sky. Most of all there are the great mountains themselves set in their rivers of ice, changing grandeur in every light and every weather. If a person will cross the ocean just to look at the beauty of a cathedral, why would he not do as much or more to see sights such as these?

Very closely associated with the beauty of the mountains are some special emotions which the highest and wildest peaks provoke. I feel a special excitement when I look out over thousands of square miles where only a handful of men have walked in the history of the world, when I explore some hidden ridge or crag, or when I make the first track across a great unbroken snow field. I feel a special happiness to be alone in the high silent places of the world tucked close under the sky. Such things are worth a little insecurity and sacrifice. . . .

The largest untouched areas left are the oceans, the poles and the highest mountains. And the demographers assure us that in less than a century it will be "Standing Room Only" even here. The human race is almost like a mold that inhabits a glass jar. The mold multiplies and grows until it so crowds the jar that it poisons itself in its own waste. People are wonderful, but an infinite number of them are not. A man must refill the inner springs of his being in solitude and reflection. I think there is a deep inner need for this. . . . This is a need the mountains can fulfill.



Pollution is nothing new. But until recent decades there was always some place to escape it. Walled and crowded medieval cities (Avignon, France, above, showing the Palace of the Popes) could be fetid sewers, with human waste flowing in the streets. Disease ran wild. Such ancient river valley lands as Egypt and Iraq, far from being "undeveloped" countries, have suffered from too much history, too much development, and without heroic efforts will remain "spent" countries. In many parts of both hemispheres long civilized lands have suffered for centuries from deforestation, overgrazing, over-mining and single-crop agriculture. In the 1840's the British Parliament recessed to another location because the foul odor of the Thames made work impossible.

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Less And Less To Wonder At

by Russell Mosely

Concerned educators throughout the ages have consistently advocated *meaningful* learning, whatever that may denote. Currently the overworked term *relevancy* seems to embrace the several meanings that may be attached to purposeful classroom growth. These various definitions hold in common that school experiences must be concerned, depending upon the maturity level of the learner, with the social, political, economic and moral issues and problems of the time. This appears to be saying that each maturing learner is to be appropriately prompted to develop the skills of independent inquiry, to grow in the ability to care, and to test the various alternatives.

This process is relatively simple to describe but is very difficult to establish and sustain. Compelling problems always must be the vehicle and alternative solutions must be weighed. In the past the consideration of community problems has been a sensitive question because of the varying factional stakes. Now, however, the urgency of accelerating environmental deterioration provides one of those elusive common causes necessary for a full-blown problem-centered program. After all, it is the question of everyone's survival, of less and less each day on this earth to wonder at. In turn, this very same urgency demands a multi- or perhaps better still an interdisciplinary approach. A problem of such magnitude has its social, political, economic, scientific and humanistic dimensions. However, such a procedure may properly vary depending upon the learning environment and its resources. A closely coordinated team approach, a multiple-period arrangement involving two or more disciplines, a single instructor drawing upon fellow teachers from other disciplines may all prove effective if marked by reasonable mastery of the various disciplines to be applied and commitment to an objective consideration of the problem as determined by the coordinated strengths and existing limitations of available resources.

Mr. Mosely is Coordinator of Curriculum Development at the DPI.

SNOW GEESE DESCEND ON A WISCONSIN WATERWAY

Environmental Education: An Action Model

by Robert E. Collins

ALBERT SCHWEITZER once said, "Man has failed to foresee and forestall. And he shall end by destroying the earth." Strife, poverty and erosion of the socio-ecological mechanics during this century seem to be fulfilling his prophecy. Man is on a collision course with nature and himself. If he does not soon alter his course, he will end with a chronicle of his own demise.

We find that water, the blood of all life, has now become a conveyor of death. It has become polluted and foul with technological and human wastes.

We look up at our sky only to find a hazy brown mantle dimming the brilliant azure of space. This brown mantle, like a shawl has been draped over major cities in our world bringing death and disability to man. In Los Angeles, it recently brought instructions to teachers to limit physical exertion of their students — no running, no jumping, no recess.

We look at our landscape, only to see it horribly scarred by architectural abortions, gaping wounds on mountainsides, ugly cuts carrying the nourishment of all life to the seas in the rush of floodwaters. The foundation of all life has been undercut.

We look to ourselves. We find death on the battlefields of questionable wars and death on city streets. Overpopulation has placed a very serious drain on the deposits in our resource bank. Our senses are sickened by the vulgarity of noise, ugliness, filth, noxious odors and by claustrophobia. We find politics, at times, to be self-serving. We find conquest — of man and nature — to be our ultimate objective.

And we read. A student writes, "It gets pretty depressing to watch what is going on in the world and realize that your education is not equipping you to do anything about it." Another asks, "Please help me. Help me to make a better life for myself and my children — one you have not made for me."

Subversive activity seems to be a current way of life. Is it not now time to make education a subversive activity — one actively aimed at a continuing reassessment of priorities and the development of rational change criteria? People who think for themselves, who can understand problems and grapple with them effectively will bring about a quality of life in this time of unprecedented and breath-taking change.

How do we bring about a greater understanding that will make it possible for man to respond to opportunity as well as need? Very much to the point here is a conclusion reached by Sir Julian Huxley in a recent article entitled "The Crisis In Man's Destiny." He wrote:

> The first thing is to reform the curriculum so that, instead of separate 'subjects' to be 'taken' piece-meal, growing minds are offered a nutritious core of human knowl-

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Mr. Collins is Director of the Environmental Science Center in Minneapolis.

edge, ideas, techniques, and achievements, covering science and history as well as the arts and manual skills. The key subject must be ecology, both biological and human — the science of balanced interaction between organisms and their environment (which of course includes other organisms) — together with its practical application in the conservation of the world's resources, animal, vegetable and mineral, and human.

Education must prepare growing human beings for the future, not only their own future but that of their children, their nation and their planet. For this, it must be aimed at varied excellence (including the training of professional elites) and at the fullest realization of human possibilities.

This formula for education emphasizes the need for an ecological approach to the whole spectrum of human learning. We therefore submit that education should focus on the whole spectrum of human experience. The learner should be confronted with the real operations of the real interacting world. Disciplines must be the tools of learning and not entities unto themselves.

If education is to provide for environmental quality, then the educational process must provide an environmental quality, for the learner, the teacher, the "to-be-learned", and the strategies for learning that will lead to:

- an *ecological* awareness — a concern for the total environment;
- an *economic* awareness — a feeling for the way costs relate to today's ecological problems;
- a *political* awareness — an understanding of individual roles as they relate to collective responsibility;
- a *problem analysis* awareness — the ability to define resource problems, bring to bear all facts of the situation and all points of view with relation to it;
- a realization that man is a part of — not apart from — Nature;
- and some grounding in the dynamics of communications between men and groups.

The Minnesota Environmental Sciences Foundation with which I am associated has for the past three years attempted to create such an environment. It has been our uppermost belief that the lack of understanding, differences of opinion and the inability to relate man's actions to his environment can best be harmonized or compromised through education. We believe that the educational process needed must provide for active involvement, it must be meaningful, it must cross disciplinary lines, and it must cause man to inquire productively into the mechanics of his environment. If we are to expect awareness and understanding, the learner must be provided the opportunity to sensually experience the interrelationships of his environment.

Several problem areas that tend to dissipate current efforts in environmental education have been noted. Among them:

(1) There are still strong tendencies on the part of educators to "catalog" environmental curriculum materials under "science". This action reinforces the very educational process that has not been effective in the past. It almost always imposes a strong biological emphasis that is not necessarily ecological in nature. It makes the task of developing an integrated curriculum program all but impossible.

(2) There is a lack of strong commitment on the part of educational agencies to implement the programs that suggest (a) more flexible daily schedules, (b) modification and/or integration of curriculum subject matter, and (c) program planning which

implies more freedom and an increased involvement on the part of students or lay citizens from the community.

(3) A persistence in removing the child from his real environment and transplanting him to wilderness areas and/or nature centers to teach him environmental mechanics of a non-social nature. These ventures are costly to the public, not long enough to provide significant attitudinal change, and do not meet the immediate need for socio-ecological understanding.

(4) General lack of cooperation and concern between various levels of school and city government.

Clearly there exists a need for education to focus on the socio-ecological aspects of environmental mechanics. Implementation programs must not suffer the inadequacies inherent in "textbooks" courses of study. They cannot afford the tunnel vision provided in lock-step sequential programs. They must be flexible and current. Learners must deal with real data on real situations.

To survive, society must be sensitive to man, his wants, and a quality environment. The outcome of learning must be an educated, action-oriented populace that is ecologically knowledgeable. The need, therefore, is for programs built around a style of inquiry that focus upon man's communities and their impact upon the land. We must employ the strategy of utilizing current, real events in the educational process.

Within the past year, this Foundation has planned, developed and partially implemented a "Community

Detergent suds billow up on the Wisconsin River in this 1965 photo. Efforts to remove the long-lived sudsing action of detergents have had some effect, pretty much preventing further scenes like this. However, phosphates and several other dangerous pollutants remain in detergents, threatening the life in our rivers and streams. The natural, but normally very gradual, eutrophication of lakes is swiftly accelerated by detergents and nutrient-containing wastes that foster dense algae growth which bring on fish kills and foul odors.

Environmental Studies Program". It is designed in such a fashion that participation in this program will promote environmental literacy through continued exposure to underlying principles and concepts presented within the matrix of the learner's immediate experience. Educational experiences focus on "mini-systems" found near the school and/or in the community that demonstrate environmental mechanics on a functional and comprehensible scale.

Many current programs focus on single strands of the web of environmental relationships. This program deals directly with real interrelationships of man-land problems. Those involved in the program are exposed to the operative mechanics of their surroundings in a social context. Specific outcomes of participation in this project follow with an accompanying operational rationale.

A. An Improved, Functional Socio-Ecological Awareness

It is recognized that ecologic and social needs are not value free. There is some question as to how well an effective social program of cherishing the environment might complement our pre-occupation as a nation with individual freedom. This program accepts the notion that representatives of society are charged with the responsibility of solving socio-ecological problems. Accordingly, participants are responsible for the development of solutions to problems that are acceptable to society. Student-derived change criteria will, therefore, reflect their consensus about an acceptable solution.

Meaningful socio-ecological descriptions of neighborhoods in which the learner is located and his relationship to individuals or community institutions would be developed from his data. Conclusions would be contingent upon the community in question and its environmental needs at the time the experiment is done. Local project results would be logically attributable to current and real differences in: (1) the environmental situation, (2) the participants, or (3) some relationship between these two dimensions.

B. Meaningful Training For Responsible Community Membership

We accept order and change as important dichotomous attributes of any social system. Today the principle of fragmentation appears to be outrunning the principles of unity. It is producing a higher and higher degree of disorder and disutility. There is a disaffection among our youth. These partially or totally alienated individuals become an available resource for extremist groups.

It is necessary that programs are developed to change the status of those who now marginally participate in the rights and duties required by their citizenship status. The "Community Environmental Studies Program" is action-oriented in intent. The educational process places the learner in a position to systematically compare the rational alternative solutions to significant, real socio-ecological problems.

Everybody's Business

Participant-derived information is intended for dissemination to responsible social agents within the community. Any local ameliorative action taken as a result of the aforementioned will tend to dispell the discouraging assumption that change in society only results from the influence, social status and machinations of single elitist groups within the larger community context.

More specifically, this project makes

provision for developing effective social leadership as follows:

(1) It explores channels which provide for rational and sincere expression of diverse opinions as related to the quality of life.

(2) Avenues are developed through which potential leadership of all types gains access to formal positions of recognition and influence by participating openly with one another in the public arena of environmental affairs.

(3) Students are caused to evaluate social alienation as related to environmental problems and attempt to derive means to offset this tendency.

New attributes sought by this project do not redefine environmental criteria, but rather elaborate them. It is with the belief that (1) the learner must assume the responsibility of setting forth empirically established relationships of socio-ecological variables, and (2) make them available to members of their immediate society who can redefine these criteria. There is a high probability that he will also use them himself when he assumes that role in society.

Students, educators and individuals from the community-at-large who become involved in this program must use integrated materials bridging the several disciplines. Participants accumulate real data that is used in the formulation of partial operational models of interrelationships found in their respective communities.

C. Increased Emphasis Upon Inquiry Training

As implied by Sir Julian Huxley, a teacher can no longer be viewed as an omniscent focus of learning. Meaningful environmental education programs lay an additional charge of responsibility on the doorstep of the teacher. Their success depends upon teachers' acceptance of the challenge to reidentify the parameters of disciplines and their relative role in learning.

The "Community Environmental Studies Program" offers no "right answers". Teachers assist only in the formulation of participant-derived alternatives which have the temporal limitations of current technological knowledge and the social situation. They are accepted as such. Change generates new data. Teachers guide the modification and/or identification of alternative solutions to socio-ecological needs.

Revise Present Practices

In summary, it is imperative that we preserve the development of programs which focus on the socio-ecological aspects of environmental education. Initial feedback on the "Community Environmental Studies Program" suggests that an approach which focuses upon man-land interrelationships is most promising. It is anticipated that further testing of this model will confirm the need for a significant departure from present educational practices. Man, his social institutions and their ecologic impact on the spaceship earth will become the central theme to a functional, realistic curriculum for schools.

A World Fit For Life

We are confident that current educational innovations will insure the learner a greater understanding of his world — and the wisdom to interpret and determine his actions. Through an educational process that will not permit technology to outpace understanding — nor allow cleverness to grow faster than wisdom — will come a people that seldom make headlines, but rather, content to make a world fit for life. Rather than ask the question, "How can we?" the question will become, "Should we?"

SCHOOL SITES FOR ENVIRONMENTAL EDUCATION

Forest Park Outdoor Education Center At Franklin

Richard Pladies is seen working with middle school science class in the outdoor classroom.

by A. L. Block

THE Outdoor Education Center at Franklin emerged as a natural by-product of the building and site planning of the new Forest Park Middle School which opened its doors this September. Before the school district purchased it, the site was a working farm. It included a small pond ringed with willows and seemed to lend itself naturally to developing as an outdoor learning center.

Plans for this development were submitted by the instructional staff, endorsed by the school board, and coordinated with the overall building schedule. A supplementary budget of $2,000 was established and Richard Pladies of the Forest Park School staff was given responsibility for center development last summer.

To date five acres of the 49-acre site of the Forest Park Middle School have been developed into the Outdoor Recreation Center. Included are the pond of approximately 5,000 square feet; three acres of pasture bordered by a mature hedgerow and containing a variety of food-bearing trees and shrubs; two outdoor classrooms; approximately one-half mile of trail, and several blinds for observing wildlife.

Two paved outdoor classrooms equipped with park-like tables and benches have also been completed, as well as trails, a dam to stabilize pond water levels, bridges, signs and related instructional materials. With the first phase of development almost completed and the basic physical facilities established, continued expansion and development over the years will be related directly to student learning activities.

No separate curriculum is anticipated for the center. Instruction is planned as enrichment or "plug-in" experiences supplementing or expanding existing instructional programs in science, social studies, art and language arts. Learning activities at the center stress *doing*: observing, collecting, classifying and analyzing. Tour guides are being developed on the levels: primary, elementary and secondary/adult. Continuing develop-

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Mr. Block is Director of Instruction, School District No. 5, Franklin, Wis.

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ment calls for the establishment of peripheral planting, a small arboretum, maintenance activities and split rail fences.

During the months of May, June, September and October the center will accomodate an average of 1,000 student use-hours per week on the middle school level, plus selected one-half-day field trips from the elementary schools and high school. Now in the planning stages is a summer program in environmental studies, and additional uses are being planned for the winter months.

Any attempt at an in-depth evaluation of the center and its program would be premature now. We do know, however, that student-teacher interest and enthusiasm are high and that discipline problems are minimal. Furthermore, we can assume from initial observation and reports that the center will be a success and that the concept on which it was established is valid. We can conclude that an effective, functioning outdoor education center can be developed with a minimum budget, capable of accomodating a number of programs in a more effective manner than similar learning experiences in traditional, high-cost facilities. The close proximity of the center to the school building is one important factor in its successful operation and suggests that future developments of this kind consider location as a high priority item.

Visitors to the center are always welcome, but we do ask that the principal, Karl Wegerbauer, be contacted in advance.

Trilliums grace a forest floor. A member of the lily family, the trillium is a protected flower in Wisconsin; once picked, the plant dies. Amateur horticulturists who wish to include the flower in their wildflower gardens may purchase plants commercially.

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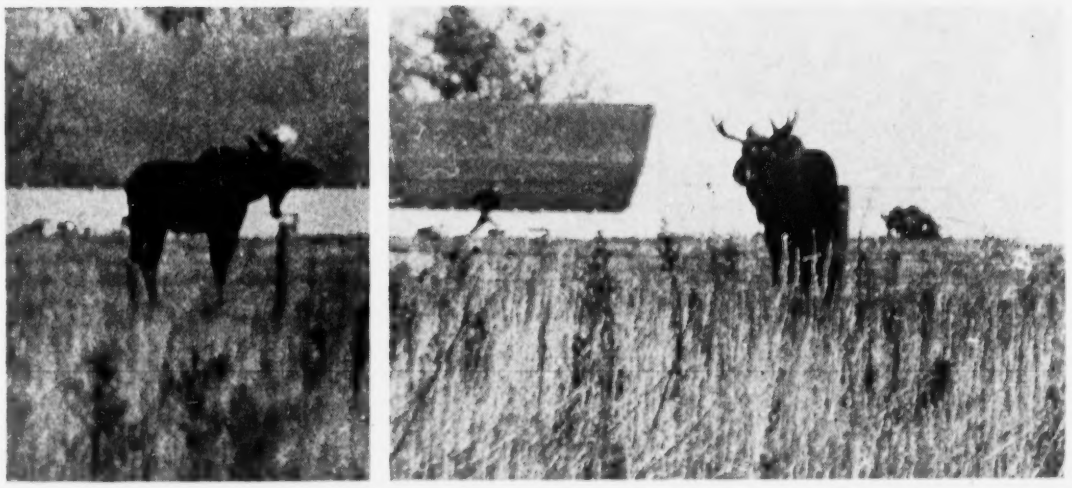

Bull moose wanders onto a northwest Wisconsin farm as farmer dashes to spread the word. After many decades of absence, moose began to drift in from Minnesota about 10 years ago. Hunting them is strictly illegal.

Improving Wisconsin High School Conservation Courses

by David Engleson

IN THE mid-1930's the Wisconsin Legislature adopted laws requiring all public elementary and secondary schools, and all teacher training institutions to offer "adequate and essential instruction" in the conservation of natural resources. The State Superintendent of Public Instruction, the Dean of the College of Agriculture and the Conservation Commission were assigned responsibility for developing courses of study for use in secondary schools and teacher training institutions.

Laws were also passed requiring "adequate instruction" in the conservation of natural resources for those requesting certification and licensing to teach science or social studies. Eligibility for state financial aid was tied to compliance with these laws.

To help with the schools' instructional program in the conservation of natural resources, the Legislature also passed laws allowing municipalities, including school districts, individually or jointly, to own and operate com-

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munity forests and school conservation camps. The passage of these laws set the stage for the development of secondary school conservation course. An additional impetus was provided when Stevens Point State Teachers College (now Wisconsin State University-Stevens Point) developed an undergraduate major program in conservation education during the late 1940's.

What is the current status of Wisconsin high school conservation courses? The most recent survey of teachers of such courses was conducted during the 1968-69 school year. A detailed report of this survey was published in the September 1970 *The Science Teacher*, the official publication of the National Science Teachers Association. It is also available in mimeographed form from the author in the Department of Public Instruction.

The following statements summarize the report:

1) Of the 52 teachers (representing 46 schools) responding to the survey 16 had undergraduate majors in agriculture education, nine in biology and eleven in biology in combination with another field. Only two conservation education majors and six biology-conservation education double majors were teaching conservation courses.

2) Only four of the 52 conservation course teachers had substantial training (minor or equivalent) in the social studies.

3) Only about one per cent of Wisconsin students in grades 9-12 received instruction in the conservation of natural resources in a separate course.

4) According to the responding teachers the majority of the above students possess below average ability.

5) Twenty-six of the 46 schools responding to the survey said they followed a syllabus but only 14 of these were able to supply a copy upon request. Three additional schools said they followed a text. Seventeen schools indicated they followed no written plan.

6) The majority of conservation course field experiences were related to forestry. Many "naturals" for field work, such as nature study, tree planting and tree pruning were frequently taught without it!

7) Transportation limitations and conflicts with other classes were cited most frequently as reasons for not offering field experiences.

8) Forty-one or more of the 46 responding schools indicated they include instruction in plant (forest), soil, water, wildlife and recreational resources. Only 16 considered political aspects of conservation, 13 considered regional planning and 21 urban conservation problems.

The results of the survey raise many questions about the effectiveness of Wisconsin high school conservation courses. Are the best prepared teachers teaching them? Do they serve the right school population? Don't all persons need the experiences such a course might offer? Why can't meaningful field experience be offered in these courses? Shouldn't they be field-oriented? Why do they largely ignore the study of urban and regional problems when we know that the vast majority of today's high school students will live in an urban area?

to be a *capstone course* to a K-12 program in environmental education, a program integrating the teaching of environmental education concepts into all subject areas, but science and social studies in particular. Such an integrated program should try to (a) develop an understanding of both the biophysical and sociocultural environment and the problems associated with it, (b) develop an understanding of how these problems might be solved using existing institutions and new ones if they are needed and (c) develop attitudes which motivate students to act towards the solution of environmental problems.

A kame (or low hill of glacial sands and gravels arranged in stratified order) graces the landscape at Long Lake, near Fond du Lac. Many unique but unspectacular land forms are disappearing from the scene because of burgeoning "development." Little true prairie land is left, although conservationists are rallying to preserve what still exists.

Do Wisconsin school district administrators feel that high school conservation courses are needed? Those attending the Governor's Conference on Environmental Education felt so last February and recommended that the Department of Public Instruction and the state universities collaborate in developing guidelines.

How can Wisconsin high school conservation courses be improved? What guidelines might be followed in developing them?

1) Consider the high school course

2) Develop and teach the course as a joint offering of the science and social studies departments.

3) Center the course content around local environmental problems studied in the local community whenever possible.

A course of action such as these guidelines suggest would require a program of both preservice and in-service teacher training activities, environmental education curriculum

A "big burn" rages in a second growth Wisconsin forest. Right, a wistful marten —a rare and endangered species in the state—lurks in a tree.

development in all disciplines and extensive study and research into attitude developing, particularly as it applies to environmental problems.

Obviously the above are not totally within the capabilities of the local school district. A cooperative statewide effort is needed and is being planned. This effort will include another survey of Wisconsin high school conservation courses and hopefully will show many changes in the direction of the above recommendations.

Wisconsin Statutes	Requirements
37.29	Universities, state colleges and county teachers colleges must offer "adequate and essential instruction" in conservation of natural resources
118.01	Elementary and secondary schools must teach conservation of natural resources
115.31	State superintendent, dean of college of agriculture of state university and conservation commission shall cooperatively prepare course outlines for high schools, colleges, and universities
118.19	Teachers certified or licensed to teach social studies and/or science must have "adequate instruction in conservation of natural resources." (Note: Does not apply to certification of elementary teachers at this time.)
121.02	Requires both basic and integrated aid districts to teach conservation of natural resources in order to receive state financial aid
28.20	Allows municipalities, including school districts, to own and
118.05	operate community forests and school conservation camps

Enlightened farming methods lend grace and beauty to Wisconsin hillsides. While the kind of strip cropping and contour plowing shown here frustrate erosion and soil depletion, they are not practiced as widely as they might be.

Science and Environmental Education: A Proper Perspective

by Kenneth Dowling

At the conclusion of the 1948 fall semester course in freshman botany at the University of Wisconsin a biologist, whose name is now all but forgotten, delivered an emotional lecture based on his conclusion that starvation will be the inevitable result of man's interaction with the environment. The credibility of his statement was adequately established by slides depicting starving masses in South America where science, technology, economics and politics were not developed to a sufficient extent so that the ecological breakdown could be delayed. Blessed with the hindsight born of current environmental consciousness, one sees the professor as a pre-

cursor of the present, and wonders what is wrong with an educational system that let his words go unheeded for over twenty years.

Was it because of his science background that the biology professor had an insight into the problems of world population? Perhaps. But writers from other fields have taken the same logical route to a prediction of disaster and they did it much earlier. In 1798, nearly two centuries ago, Thomas Malthus wrote his famous theory on the limitations population growth places on social improvement. He observed that "population, when unchecked, increases in a geometrical ratio. Subsistance increases only in an arithmetical ratio. A slight acquaintance with numbers will shew the immensity of the first power in comparison to the second." Malthus saw this observable fact as "conclusive against the perfectibility of the mass of mankind." Malthus was, in today's terms, a sociologist.

A Common Concern

The eighteenth century sociologist and the twentieth century biologist alike came to conclusions that led to a common concern. They both had a capability for making observations and drawing inferences from those observations that led to similar determinations although they are separated in time by 172 years. However, the advantage in making observations appears to be with the biologist, since by his time the world population had increased to over two billion from only five hundred million at the end of the eighteenth century and the corresponding effects were increasingly apparent. Perhaps for this reason his prognosis was more disturbing — starvation as compared to a limited quality in society.

Since 1948 the effect of the Malthusian Doctrine has grown with the same geometric progression as the unchecked population, and pollution has appeared as a new concern. The word pollution is used in fear and contempt by secretaries at coffee breaks, by vice presidents in political speeches, by politicians only lately apprised of its drawing pour, and by teachers in their classrooms. Paul Ehrlich, by training an entomologist and now a recognized spokesman for the environment cause and a prominent ecologist and author, stated in an interview that he saw pollution as directly related to overpopulation but not necessarily the result of it. "If we take the problem from the pollution end and try to reduce the impact of each person, it's obviously going to be necessary to reduce it less drastically if there are fewer people. . . . It's pointless to argue whether it's pollution or population; it's the interaction of the two and the only intelligent approach is to attack both simultaneously."

It becomes apparent that the long-aborning environmental problem is not a science question although the methods of science may be used to discover the correlations between cause and effect that tell the technologist what he must or must not do to maintain a quality environment. Pollution and its related problems result from the improper actions of too many people. If the population of the world is to continue increasing, or even remain the same, the actions of people must change. Science does not determine actions, but value systems do; and they are established through experiences which, when summed up, become education. It is a valid assump-

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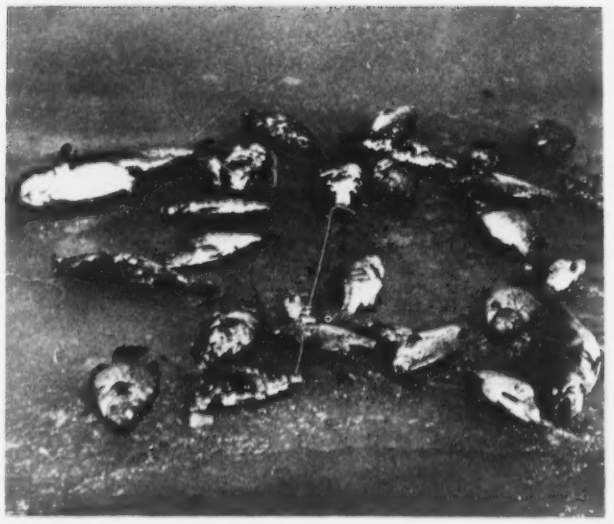
tion that formal education provides experiences that can modify value systems.

It is important to realize that all subdivisions of formal education have a role in providing the experiences that will establish personal values making maintainance of a quality life in a quality environment a primary concern for everyone. Values are formed from literature, from history, from working with one's hands, from investigating natural phenomena.

What, then, is the role of science education in environmental education? In an effort to answer this question the Council of State Science Supervisors held a conference in Portland, Oregon in May 1970. The final report from that conference includes the following statement:

> Educational practices can temporarily change the behavior of some by indoctrination. In extreme emergencies such procedures may be valuable. However, the temporary nature of such changes and subjective judgments concerning which kinds of behavior are most needed make dogmatic techniques ineffective or even undesirable.
>
> Educational programs should be designed to provide a humanizing general education that will nurture individual values which encourage the adjustment of personal life styles to the best interests of society as a whole, and which will lead to a cooperative effort to maintain a quality environment.
>
> General education must use resources from all the disciplines. Science education, as one component of the total experiences, is particularly suited for the employment of investigatory processes which can be provided in imaginative ways to help students understand environmental interactions. Comprehension of the contents and processes of science as a significant portion of human culture contributes to the development of values which dramatically influence behavior.



This statement, although it does not negate informational teaching about environmental problems, puts the basic value in science education on its academic contribution to producing fully educated citizens. This is not a change that has come from a new en-

Fish kill (top) in a Madison area lake offers shocking evidence of water pollution. Sewage, chemical fertilizer runoff from farm fields and boaters' spillage of gas and oil all contribute to this slaughter. Eroded banks at left might have been held firm by deep-rooted vegetation. Two millenia of spoliation of the natural environment have not completely brought home to man the folly of his trying to remake nature or of regarding wilderness as hostile.

vironmental awareness. This goal has existed for some time and in recent years considerable progress has been made toward attaining it through large scale curriculum efforts, changes in teaching practices and philosophies and broader, improved teacher training programs. Implementation is still lagging behind development but results have been encouraging enough to make any new vacillation in purpose or technique questionable. The essential steps to be taken require refinement rather than a change in direction.

In the October 1970 issue of *The Science Teacher*, the journal of the National Science Teachers Association, official position statements have been made describing the role of the science teaching profession in current problems. In the statement on Social Implications in Science Teaching it is observed that

> It is essential that man make intelligent decisions regarding the use of scientific developments in restructuring his environment. He must, therefore, have an understanding of the scientific and social components of the problem so that he can predict probable results of his decisions and actions. . . . In the teaching of science, educators have an opportunity to influence the social progress of the world by developing in students an understanding of the principles and processes of science and, in so doing, encourage rational thought in human behavior.

To continue with curriculum evolution the NSTA position promotes addition of another aspect of science education. This emphasis on relating science to society is still largely lacking in the available curriculum resources. The efforts have been directed primarily toward concept formation while developing learning processes.

In *A Guide to Science Curriculum Development*, published in 1968, the Department of Public Instruction listed five cultural implications of science that should be considered throughout the K-12 curriculum. The statement of Sociological Implications concludes that

> The student of science should be aware of the problems of technological advances based upon scientific knowledge so he can react to his ever-changing society in a positive way. Every generation will be faced with decisions involving technological progress intended to improve the lives of men. It is important that each person look intelligently and analytically at all aspects of such development. Everyone must realize that individuals, industry and the country as a whole stand to benefit from technological advances. However, they must also realize that the motives behind such advances do not always provide for the needs of society.

Education as a whole has a major responsibility in reacting to obvious environmental problems. Science education must accept a part of that responsibility, but one must avoid the idea that imparting scientific information alone will fill the bill. Science educators are working to develop and implement programs that will lead their students to understand their natural environment as well as the nature of science and its social implications and to use their process capabilities to further their understanding. Such programs will not reflect an abrupt change to meet societal demands, but they will be adjusted to direct the learner in the most effective way possible to contribute to maintaining a high quality environment for everyone.

The training of children is a profession, where we must know how to waste time in order to save it.

— Jean-Jacques Rousseau

Social Studies And The Environment

by H. Michael Hartoonian

As he introduced the Environmental Quality Education Act in Congress last year, Senator Gaylord Nelson made the following statement:

> Education, I believe, is the only proper way to influence values, attitudes and basic assumptions in a democratic society. Behavior in the long run, can best be changed through the process of education.

The assumption made by Senator Nelson is that emphasis on environmental education, like the emphasis on science and math education after Sputnik I in 1957, will have a positive impact on our environment, in much the same way that the National Defense Education Act has had upon the critical subject areas. However, if environmental education is to be something of value, educators must come to grips with the central issue which Senator Nelson refers to — value and attitude change. We must ask:

—What changes in values (behavior) are needed?

—Who will determine the direction of the value changes?

—Can schools affect fundamental value changes without concomitant changes in the larger community?

These questions should not stymie our efforts to deal with problems of the environment. Indeed, social studies educators should welcome the challenge of working with students in an already familiar area — value analysis and controversial issues. If, as Senator Nelson suggests, our behavior toward our environment is based on unexamined values and faulty assumptions, then it should be the business of education, and particularly social studies education, to examine these values and challenge the assumptions. Teaching the process of value analysis may seem a large order, but the analysis of values is related to *any* topic that is controversial. As a matter of fact, we can define controversial issues as those which rest upon conflicting value-belief systems. Furthermore, since conflicting belief systems or moral dilemmas abound in all areas of human existence, to suggest that the teacher of social studies not deal with the area of controversy (including environmental issues) is indefensible.

A rationale for the inclusion of environmental problems (controversial questions) in the social studies curriculum must be couched in terms of value clarification. This, it seems, is exactly what Senator Nelson suggested in his presentation to the Senate. Social conflict (controversial issues) has been categorized in many different ways. For example, Hunt and Metcalf argue that human conflict is of two types: intrapersonal and interpersonal. They suggest that intrapersonal conflict in individuals manifests itself in uncertainty as to what to believe or

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value. Individuals who are inconsistent or uncertain cannot engage in morally responsible behavior based upon intellectual understanding and personal commitment. Hunt and Metcalf argue that this uncertainty, this inconsistency, this inability to establish a commitment to anything is in large part due to the school's failure to deal with "closed areas" or controversial issues (certain areas of conflicting belief, i.e., social class, race relations, environmental problems, etc.). Raths, Harmin and Simon also suggest that the failure to clarify value positions can mean a continued existence of apathy, uncertainty, inconsistency and uninvolvement. Kenneth Keniston further claims that the "now" generation's attribute of uncommittedness is due mainly to their inability to clarify their values and commit themselves to them.

Thus, environmental issues (controversial questions) are an important and necessary area of study in the social studies if value-belief systems are to be examined; and the analysis of value-belief systems is necessary if individual commitment toward the solution of environmental problems is to be achieved.

Without doubt, the handling of controversial issues can be one of the most difficult, and at the same time most important activities that a social studies class can engage in. The difficulty of handling issues in the classroom stems from the fact that three basic problems must be clarified before issue resolution can be achieved:

1. The problem of identifying and clarifying values which are in conflict and choosing among them (in public controversy, laws may also be in conflict);
2. The problem of clarifying the facts in the issue; and
3. The problem of clarifying the definitions of words used in the controversy.

In presenting issue controversy in the classroom, perhaps the best teaching strategy is the case study approach. Through the case study students can gain experiences dealing with value

Rapidly approaching endangerment in Wisconsin is the proud and noble great blue heron, perhaps our most spectacular waterfowl, rivalled only by the sandhill crane, who is also disappearing. Wisconsin Indians called the heron Shu-Shu-Gah.

problems, definitional problems and factual problems which can help them develop what Don Oliver calls "principles of analysis."

Putting the controversial situation in a case study gives a sense of reality to the issue, and, more important, allows the student to discover (internalize) "principles of analysis" through practice.

In considering issues on environmental problems, the social studies teacher might look at the following:*

1. It is believed that an annual economic growth rate (Gross National Product) of between 3% and 4% is necessary if the United States economy is to escape a depression; it is also believed that if the quantity of production is maintained or increases we will be faced with an irreversible environmental crisis.
2. It is believed that only the individual citizen can effectively control pollution; but it is also believed that we live in a highly organized society, a society of corporations and institutions where the individual is quite helpless.
3. It is believed that the government should trim spending; but it is believed also that large sums of money from the federal government will be necessary if pollution is to be controlled.
4. It is believed that population (too many people) and the processes used in trying to meet the needs of people is the major cause of pollution; but it is believed also that an increasing population means an increasing market which is important to the growth of any economy.
5. It is believed that the American society is one of the most mobile societies in the world, and this mobility is necessary in providing economic opportunities for our citizens; but it is also believed that the American pre-occupation with movement has interferred with our ability to develop more stable families, communities and institutions.

The above list of issues is suggested as a point of entry into the study of environmental problems which, above all, is the study of alternative actions based on a careful analysis of the facts and the values present in the issue.

If environmental education, as an adjunct to social studies education, is primarily concerned at the high school

*In dealing with the suggested issues here, as with any controversial issues, it is suggested that the conceptual framework of value problems, factual problems and definition problems be applied. For example, in any of the issues studied, questions can be raised relative to the nature of the values that are in conflict, the facts involved in the issue and the definitions of words used in describing the issue or controversy.

level with an analysis of values then what would be the function of the elementary social studies program in this area of ecology? To be sure, issue analysis is certainly not the sole domain of the high school program. Issues can be investigated at the elementary school level also. And, the same conceptual framework (asking what value problems, factual problems and definitional problems are suggested by the issue) can be used. However, the elementary school social studies program should also emphasize man's interdependence with his environment. One of the problems that manifests itself in a rapidly-changing society is that people have a difficult time simply examining their surroundings. At a very early age, students should be taught how to "observe" their environment. They should be encouraged to make judgments about their environment relative to its beauty and ugliness; and they should always be encouraged to suggest how they would go about creating a better quality environment for all our citizens.

The social studies community of Wisconsin is urged to pick up the challenge of environmental education, for it is this group of educators who can, perhaps, make the most significant contribution to the solution of environmental problems.

Aesthetics and the Environment

by Earl L. Collins

Pollution of the biophysical environment is the main concern of most persons attempting to save our deteriorating environment. Solid waste dumpage and the destructive exploitation of natural resources are imminent factors threatening the life-sustaining quality of the planet. The declining condition of the environment has been hastened by man's preoccupation with science and technology and their contribution to a materialistic standard of living never before experienced. This high standard has been achieved for a small percentage of the world's population, but at a devastating cost to all of mankind.

Environmental deterioration might be avoided or greatly reduced if man would balance his scientific and technological abilities and expectations with aesthetic sensitivity and values. Aesthetic qualities are not limited to the arts but are an integral part of the dynamic pattern of life. Relegation of aesthetics primarily to the arts, and regarding them as luxuries, has deprived industrial and post-industrial man of an element necessary for maintaining a balanced and healthy environment.

Aesthetic responses involve perception through all of the senses and they influence man's ideas and emotions. These inner experiences are the essence of humanism, the element most

Environmental education in action: At a conservation camp in Marathon County an instructor and a group of girls study stream life. Even the smallest natural body of water teems with life in many forms, but pollution shifts the balance from the best species to the least desirable, or wipes out animal life entirely. Scuba divers from Long Island Sound to the Santa Barbara Channel report water bottoms literally lined with beer cans and other unsightly debris.

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At the educational conservation camp in Marathon County a boy sketches what he sees, in his art class.

lacking in man's treatment of the environment. The arts stress aesthetic experiences and values. Other subject areas might gain some insights from them in order to provide a more humanistic approach to learning and dealing with the environment.

The environment has not been treated as a place to fulfill human beings but has been given over to things and economic expediencies. Cities are not designed for man when one considers their size or the fact that over 60 percent of the street area is devoted to the automobile, leaving man to struggle for survival against carbon monoxide, human and mechanical traffic, confusing visual pollution and disturbing sounds and odors.

A fundamental concern of the aesthetic domain relates to the integrity of materials. This respect for materials, whether they serve as an inspiration or in a functional manner, applies to anything that man might be involved in contemplating or reshaping. Ian McHarg, Chairman, Department of Landscape Architecture, University of Pennsylvania, the first professional planner to recognize the need for letting nature show the way in environmental planning, stresses "design with nature." He calls his method "physiographic determinism." His basic philosophy deals with the integrity of the physical aspects of the earth and a recognition of its potential and limitations before intruding upon it. Education in the arts stresses this integrity of materials whether it is designing a formal work or a city.

Aesthetics deal with all five senses and these senses are the perceptors through which man receives information and emotional stimuli. We tend to equate survival of man with having

an adequate supply of food, water and reasonably pure air. These are basic needs, but if we look at what constitutes an optimum existence or environment we must move beyond Abraham Maslow's first step of man's needs (food and water). The major danger consists in losing a quality environment and not realizing it. The quality of the environment can be eroded without our being aware of the loss. This has happened already. Man's senses have been atrophied to the extent that he accepts all sorts of polluting and destructive factors. One of the primary functions of education ought to be the development of each learner's perceptual awareness.

Sound pollution affects almost every human being whether he lives in an isolated rural area where sounds of jet planes or internal combustion engines intrude, or in an area where air hammers, power mowers, auto traffic and electronic sounds destroy his hearing abilities or create emotional instability. The visual pollution of our environment is beyond belief. This extends from the visual clutter of the man-made environment to man's intrusion upon nature. The expulsion of noxious odors into the environment is still another assault upon man's senses. We have grown accustomed to chlorinated water and all of the other factors which reduce the quality of our environment and existence. One must wonder how much more human beings can tolerate before they are reduced to a sub-human level. The educational process should provide learning experiences which cause the learner to be highly conscious of all his senses — cognitive information is not enough. Aesthetic factors cannot be relegated to the art shrines of the museum or concert hall but should be an integral part of man's daily existence.

A well-tended, Wagnerian forest in the Harz mountains. As any ardent hiker-through-Europe will attest, there is little to be found anywhere that compares with the serenity and orderliness of a German woodland, where forestry has been a fine art for more than a century, except perhaps for the occasional hardwood lots still maintained by enlightened farmers and conservationists in parts of Wisconsin, Illinois and Indiana and some of the better state parks.

Mathematics in Environmental Education

by George L. Henderson

AMERICA has become a full-blown crisis-oriented society. Ecology has been transformed from an arcane academic discipline in a matter of two or three years into a household word. Threatening problems concerning air, water and soil abuse have been trumpeted throughout the land. Today man faces the responsibility of undoing much that he has done so that future generations may live in an environment that enhances rather than degrades and dehumanizes their lives.

In many cases it is students who have forced awareness of the environmental issue. But in their impatience, they quickly become distracted by other issues. So now it becomes the adults' and the teachers' responsibility to keep the momentum going and to become involved themselves in helping keep young people aware of this growing problem.

Mathematics educators at all levels — elementary teachers, junior and senior high school teachers, university mathematics educators, and mathematics consultants and supervisors — are urged to devote at least a portion of their talent and energies to helping mankind solve the environmental pollution problem.

One way that we can assume our part of this challenge is to expose our students, through mathematics, to the causes of our unhappy circumstances and alert them to means of responding to the challenge that faces each of us today if we are to live tomorrow. Young people need to be educated in such a way that they quantifiably understand at least some important ecological aspects of the environment. Mathematics educators can accomplish this by teaming up with science and social science educators to add a mathematical dimension to aspects of the curriculum that deal with environmental pollution and spoliation.

Mathematics classes can be livened up by discussions and arguments. Assertions about environmental pollution often will not stand up to quantifying analysis. For example, the "green house" theory states that the polar ice cap will begin melting by the year 2000 because the man-produced accumulation of carbon dioxide in the atmosphere keeps the sun's radiation from escaping the atmosphere and causes the mean average temperature all over the world to increase by 3.6 degrees Centigrade every 40 years. This theory can be put to a mathematical test. If temperatures in the Antarctic vary from 32 degrees Fahrenheit to 127 degrees below zero Fahrenheit, how many degrees Centigrade must the mean temperature in the Antarctic be raised before the polar ice cap begins to melt?

Another contrasting assertion is that pollution caused by particulates in the air which reflect the sun's radiant energy effects decrease in the world's

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temperature, leading inexorably to another ice age.

Last year college students in California collected $2,000 and purchased a new car, then buried it so it wouldn't pollute the air. If 1970 cars pollute the air one-fifth as much as 1965 cars, wouldn't the students have served the cause of pollution ten times as much by purchasing 1965 cars?

Many more issues like these can be examined from a mathematical point of view.

The Wisconsin Mathematics Council, affiliate of the National Council of Teachers of Mathematics, recently cooperated with the Wisconsin Department of Public Instruction in a project that resulted in a publication which can be used by junior high mathematics teachers and senior high general mathematics teachers to provide pupils with opportunities to practice fundamental arithematic skills. The publication is *Pollution: Problems, Projects and Mathematical Exercises, Grades 6-9*. Its preface states: "This mini-book is intended to serve as inspiration for mathematics teachers and students concerned about the environmental pollution."

Challenging Abilities

This handbook contains exercises designed to improve computational skills, and the exercises are classified into current mathematical topics commonly taught in grades 6 through 9. It also contains a section of special problems intended to challenge students' problem-solving abilities. The projects included were designed to encourage student research activity.

One of the problems in the handbook deals with the word ECOLOGY in this manner:

> *Ecology* is a branch of science dealing with the relations between living organisms and their environment. How many different ways can you read the word "ecology" in the following array, beginning with an "E" and ending with the "Y"? (you may zig-zag at right angles)

Note: Before you begin, guess an answer.

```
                E
              E C E
            E C O C E
          E C O L O C E
        E C O L O L O C E
      E C O L O G O L O C E
    E C O L O G Y G O L O C E
      E C O L O G O L O C E
        E C O L O L O C E
          E C O L O C E
            E C O C E
              E C E
                E
```

One of the projects deals with wasting water and includes the following suggestions:

> If you are in the habit of letting the water run when you brush your teeth, try this plan. The next five or ten times you brush your teeth put a container under the faucet and catch the water that would have run down the drain. Measure the amount and arrive at the average number of pints, quarts or gallons that would have gone down the drain. If you brush your teeth on the average of 3 times a day how much water would you use in 1 day? If there are 4 members in a family what would such a family waste in one day? 1 week? 1 year?
>
> If you limited yourself to using just 1 cup (standard measuring cup) of water to brush your teeth what fractional part would this be of the water that you used when letting the water run? Can you

express this savings as a per cent?

There are 7½ gallons of water in a cubic foot. How many cubic feet of water would the family of 4 have used in the year? Find the cost of a cubic foot of water in the community in which you attend school. Find the cost of the water used then by a family of four in your community.

Mathematical exercises are classified according to topic. The following exercises are classified under real numbers.

Loudness of sounds is measured in decibels. According to scientists, sounds above 85 decibels can eventually damage the human ear. A motorbike vroom may reach 110 decibels. This is how many decibels higher than the safe level of 85 decibels? This increase of sound is what percent above the safe level? (to the nearest tenth)

The roar of a jet plane may reach a decibel count up to 76% higher than 85 decibels. At that rate what would be the measure in decibels of the roar of a jet plane?

Further information about this publication can be obtained from the Wisconsin State Mathematics Supervisor, 126 Langdon Street, Madison, Wisconsin, 53702.

Examples such as these indicate how mathematics curriculum can act as a medium for developing awareness of environmental pollution.

Mathematics educators can make young people aware of the rapidly increasing rate of pollution. Teachers are in an excellent position to incorporate the problem of environmental pollution into their curriculum. Each teacher's own ingenuity and creativity can help him carry out an ecological theme during the teaching of mathematics. Projects initiated and problems presented can provide pupils with relevant information concerning environmental pollution and with needed practice of fundamental mathematical skills.

For mathematics teachers, as for all educators, making youngsters aware of the amounts of waste and pollution is one of the first steps toward a lasting solution to the environmental crisis.

Nelson Dewey State Park, on a bluff overlooking the Wisconsin River near Cassville, is named after the state's first governor (1849-52) and is one among many historical and scenic areas preserved for the public by enlightened state governors and legislators.

State

Most State Pollution Comes From Autos

Every year air pollution from the exhausts of motor vehicles amounts to *1,800,000 tons, or 60 percent of* the total problem in Wisconsin, according to the Wisconsin Tuberculosis and Respiratory Disease Association.

In its magazine, *The Crusader*, the Association points out that certain groups are particularly sensitive to the irritating effects of air pollution. Especially affected are persons with emphysema, bronchitis, asthma and other impairment of the respiratory tract. Air pollution is also believed to have an adverse effect on persons with cardiovascular disorders. The elderly are most frequently affected, but sufferers can be found in all age groups.

Pollutants Can Kill

Even though the effect of everyday exposure to air pollutants at low levels has not been measured, "there is presumptive evidence that exposure to high pollution levels is life-shortening and may contribute directly to respiratory diseases such as lung cancer, bronchitis and emphysema."

When air pollution is heavy, the working capacity of sensitive persons is reduced, absenteeism is higher and visits to hospitals and clinics increase. "Death rates increase," the magazine reports, "and remain above normal long after the air pollution crisis has passed."

While emissions from autos account for 60 percent of air pollution in Wisconsin, home heating and refuse burning account for 750,000 tons, or 25 percent. Industry and power generation add 400,000 tons to the air we breath, or 15 percent of the total.

UW Introduces Innovative Environmental Studies

The University of Wisconsin catalog has a new listing of particular interest to students.

The subject is the environment, and the University's Institute for Environmental Studies (IES) will offer courses for the first time this fall. A group of students and faculty has been holding daily discussions during the summer months to help assure that the courses will be pertinent to the needs of students concerned about environment problems.

The student-faculty group is also taking advantage of the opportunity for integrating innovative methods of teaching into the new Environmental Studies Curriculum currently being developed at Wisconsin.

"The opportunity to generate a new curriculum does not often arise at an established university," explains John S. Steinhart, professor of geology and geophysics and chairman of curriculum development for IES. "When it does, one is usually confronted with existing vested interests, courses, and a host of traditional ideas not easily changed. Such an opportunity for educational innovation now exists in the Institute for Environmental Studies at Wisconsin."

The IES was restructured earlier this year to provide improved impetus

and leadership to the University's research and teaching efforts in the environment area. The IES is now a divisional unit directly responsible to the chancellor of the Madison campus.

Students have already expressed their great interest in the offerings of the Institute — last spring hundreds of students pre-registered for the fall semester courses in environmental studies.

Early last spring a small group of students, frustrated by their individual attempts in pursuing interdisciplinary environmental programs, gathered and took the initiative in developing a new environmental curriculum. The students, headed by Richard D. Holland, graduate student in Urban and Regional Planning, worked independent of faculty for more than three months. "Their work in exploring new approaches to environmental education was impressive and responsible," Steinhart says. As a result of the students' interest, Steinhart organized a task force to develop a new environmental education program for IES. The U. S. Office of Education provided an $18,000 grant to support the efforts of the group.

The task group is probably unique among universities planning new curriculum programs, for it consists largely of students. The only faculty members are Steinhart, Prof. John DeLamater of sociology, and postdoctoral fellow Kenneth R. Bowling of history.

Graduate students in the group are Holland; Robin L. Dennis, physics; Nancy E. Field, urban and regional planning; and Binda C. Reich, environmental interpretation. Undergraduate student participants are Rae Ann O'Brien, Judy A. Seidman, Michael G. Sievers, Marc D. Kaufman, Dustin Lewis, Barbara A. Shindell and Will Weber. Incoming freshman participants are Barbara Olson and Robert Seltzer.

Since the task group began meeting in June, other students and faculty members volunteered to work part time on the project, including Prof. Robert H. March of physics, Prof. Max R. Goodson of educational policy studies, and Alisdair MacCormick, statistics.

The Basic Priorities

The task group has three basic goals: developing an introductory course, assessing the opportunities in environmental education that are available to students beyond the first course, and designing a general curriculum in environmental studies. "Our group is concerned with the shortcomings of education. The students became concerned about the environment, and they became aware that educational changes were needed to confront the vast environmental problems of today," Steinhart explains.

Summer discussions of the group were focused on developing the new course, IES 101, Forum on the Environment, which will be open to freshmen and sophomores this fall. The course will relate to the interdisciplinary nature of man and his total environment. The students studied the teaching of other interdisciplinary courses as well as the usefulness of new educational techniques such as individual student "contracts" rather than tests, presentation of the course in intensive eight-hour sessions, and various types of learning based on experience.

The task group is also concerned with the opportunities available in environment studies beyond the introductory course. Besides assessing the value of existing University courses

which are relevant to environmental studies, the group is considering innovations such as work-study programs, research involvement for undergraduates, and community involvement programs.

The third and most long-range task of the group is planning a general Environmental Studies Curriculum, primarily on the undergraduate level. The student group wants to avoid a structured curricular program that must be rigorously followed. Instead, the students are interested in permitting more freedom in the learning process, but they also feel that some guidelines are necessary.

No Laundry Lists

In its recommendations for an Environmental Studies Curriculum the group might very well depart from the traditional practice of developing "laundry lists" of required courses. Suggestions might range from completely individualized programs to development of a recommended pattern of experiences, such as seminar and course experience the first two years; field or work-study experience the third year; and research, community action, and knowledge integration the fourth year.

"Our goal," Steinhart explains, "is to define the options available to entering students in environmental studies. We want to tell the student how to go about constructing his own environmental curriculum, and make the student play an active role in finding the alternatives available to him as a student.

The task group students are vitally concerned that the content of the Wisconsin environmental studies program will be relevant to the needs of today's students. They want to develop a program that will prepare students for living in today's world, for finding jobs in today's environmentally-conscious industries.

This is the key to the student-faculty task group: making certain that the wave of environmental interest on university campuses will be as meaningful in ten years as it is today.

For further information, contact: Prof. John S. Steinhart, 262-1585 (office).

Program Trains Teachers For Group Leadership

A statewide model program for the training of skilled leaders in Wisconsin's grade schools is being developed by a team of education specialists at the University of Wisconsin and four other universities.

Lead teachers — certified elementary teachers who head instructional teams or units — are essential in schools where special areas of responsibility are assigned to the principal, the lead teacher or unit head, unit teachers, teacher aides, and interns.

The focus of the model training program is on helping experienced teachers learn how to become more effective in group leadership, curriculum development, and analysis and improvement of teaching. The first participants are expected to enroll in the program next summer.

Five other institutions will share an equal partnership with the UW in developing and carrying out the program. They are UW-Milwaukee, Marquette University, the State Universities at Eau Claire and La Crosse, and the Wisconsin State Department of Public Instruction. An $80,000 U.S. Office of Education grant makes the program possible.

Prof. B. Robert Tabachnick, chairman of the department of curriculum

and instruction in the UW School of Education, is directing the project. A developer of the first elementary school instructional teams in 1960, he has been involved in teacher education programs in both the United States and Nigeria. Other Madison campus faculty involved in the program are Donald N. Lange, Theodore C. Czajkowski and Ronald Cohen, assistant professors of curriculum and instruction.

Heartening Support

The response of Wisconsin elementary school educators to the concept of leadership training has been "overwhelming," according to Prof. Tabachnick. "During the past 10 years there has been a steady increase in the number of schools that are requiring skilled professional teachers to assume special leadership responsibilities," he said.

He pointed out that the proposed program is unique in teacher education in at least two ways: It regards the problem of preparing effective lead teachers as a statewide problem, and it involves school personnel themselves in the actual designing of the program.

Two phases make up the model program. In the first phase, teachers get practice experience on the campuses of participating universities. The on-campus phase is followed by on-the-job classroom experience while teachers stay in touch with university consultants.

Each of the five universities in the project will tailor its own training program to the special needs of schools in different parts of the state. Campus programs at Madison and Marquette University, Milwaukee, will have an urban focus, while programs at State Universities in Eau Claire and La Crosse will stress the needs of teachers in rural area schools. A training program for principals of urban elementary schools will be developing at UWM.

Whether the program can be continued on a regular basis next fall on the Madison campus will depend on the availability of funds, according to the project director. The current U.S. Office of Education grant will carry the project through next summer.

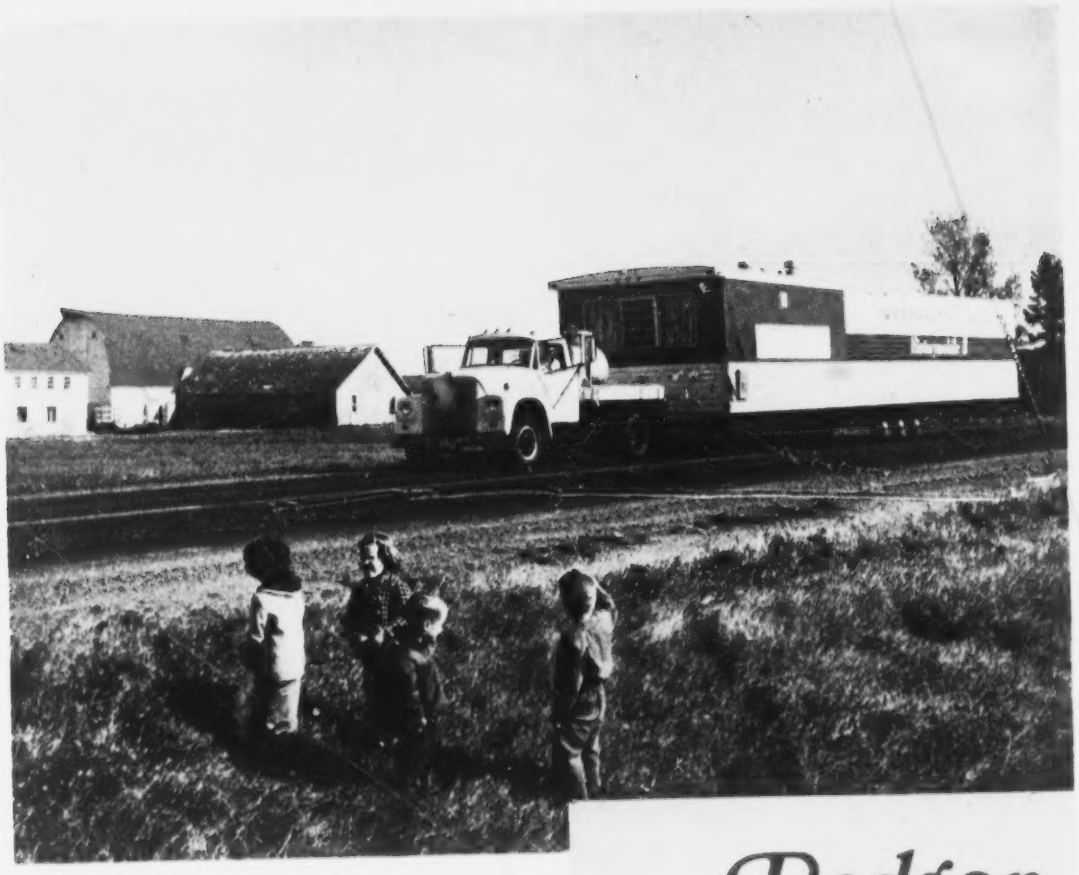
Four DPI Staffers Invited To White House Conference on Children

Four members of the DPI professional staff have been invited by the President to attend the meetings of the White House Conference on Children to be held December 13 to 18 in Washington, D.C. They are John W. Melcher, Assistant Superintendent and Administrator of the Division for Handicapped Children; Sue Ann Bates, Preschool-Kindergarten Consultant; Elizabeth Burr, Public Library Consultant, Children's and Young People's Services; and Gordon Jensen, Physical Education Consultant.

New Superintendent Named At Brown Deer

The Brown Deer school board has appointed Dr. Raymond D. Waier to succeed Chester Piskula as superintendent of school district No. 1. Until 1969 Dr. Waier had served as superintendent of the Juneau-Reeseville district.

Dr. Waier's teaching career has consisted not only of classroom teaching; he has also supervised youth and adult recreation programs and has coached basketball, football and gymnastics.



The State Historical Society's Historymobile II is shown on the road. "People and Pollution" is the current exhibit. This mobile unit will be replaced by an improved Historymobile III in January, with an expanded exhibit.

State Historical Society Aids Environmental Effort

Historymobile III, featuring an expanded exhibit on Wisconsin's environmental problems, will include dioramas, art work and panel exhibits. Following is the unit's itinerary:

Jan. 5 Columbia High, Marshfield
6-8 Pittsville
11 Assumption High, Wis. Rapids
12 Port Edwards
13 Nekoosa
14 Almond
15-18 Plainfield
19-20 Wild Rose
21-22 Wautoma
25-26 Adams-Friendship

Badger History

This valuable, 64--page issue of **Badger History** is available from the State Historical Society for $1.00 per single copy or 50 cents in quantities of 10 or more. By January another issue, "Wisconsin Environment," will be available, in which present problems will be put in historical perspective.

National

NEA, Interior Department Co-sponsor Program of Environmental Education

The National Education Association and the U.S. Department of the Interior today announced a cooperative project that will provide the most comprehensive and far-reaching environmental education program ever offered the nation's schools.

The project, which includes the establishment of environmental study areas, will employ the environment — ranging from the nation's virgin wildernesses to inner-city slums — as classrooms for students of all ages and grade levels to learn about ecology.

In announcing the joint effort, Interior Secretary Walter J. Hickel issued an enthusiastic challenge to the nation's teachers to undertake an environmental study area program.

"As teachers, the world you open up through this program will be as big and meaningful and beckoning as your own daring, imagination and enthusiasm lets it be," said Hickel.

Mrs. Helen Bain, president of the NEA, commented: "It is indeed gratifying to see the Department of the Interior recognize the ability of teachers to teach, and we are delighted to join with the Department in this program."

Mrs. Bain noted that this cooperative project is one example of a major thrust NEA is to place on environment and ecology in the coming year. "Participation in the program we announce today is a matter of policy with NEA," she said. A resolution adopted by NEA's Representative Assembly last July states, "The Association strongly urges school systems to include environmental education and human ecology programs in their curriculum. . . ."

The national environment study area program was developed by the National Park Service. The NPS and other Interior agencies are providing locations and the knowledge required to teach about the various environmental sites.

At the same time, NEA's Association of Classroom Teachers (ACT), in cooperation with the American Association for Health, Physical Education, and Recreation (AAHPER), an NEA affiliate, have published a comprehensive guide for teachers and their school districts that sets forth step-by-step the complete environmental learning program and describes how teachers can institute the program for their pupils.

"It is a marriage of our respective specialties to bring the most effective environmental education program possible to our youth," George B. Hartzog Jr., director of the National Park Service, said.

"NPS possesses the extensive knowledge regarding the nature, history and cultural aspects of a particular environmental study area. Yet our per-

sonnel, not being teachers, will rely on the membership of the National Education Association to furnish the educational and teaching know-how," he added.

Donald F. Wilson, president of ACT, said he hoped that his association's new publication, "Man and His Environment: An Introduction to Using Environmental Study Areas," will attract all teachers to the program.

"We emphasize in our booklet," Wilson said, "that this program is practical and feasible for every school district in America. It is not necessary to be within easy reach of a national park. An environmental study area can be established in a local park, at a state monument, or even in a city neighborhood."

This program is not merely a nature course per se, nor is environmental education intended to be the sole subject. The teacher uses the environment — natural or man-made, park or urban setting, historical landmark or scenic site — to help teach art, mathematics, science, social studies and communications.

ACT's guidebook for teachers points out, for example, that the sounds of an environmental study area can be the basis for music composition. Verbal and nonverbal communications can be learned by watching animals and insects. Mathematics is learned by studying the ratios of food supplies to the amount of life present. For social studies, there are the relationships and inter-reactions of various elements within the site.

Developers of the program point out that use of the study areas, combined with the guidebook and the regular school curriculum, shows the student how to relate to his total environment — cultural and natural, past and present. It develops a total concept in understanding how man is using his resources.

The state's ospreys, or "fish hawks" (these near the Flambeau Flowage), are threatened with extinction because of DDT and trigger-happy hunters, even though they are illegal trophies. Achieving wingspreads of up to six feet, these mighty birds build immense nests, consisting of sticks, seaweed, driftwood, rope and even old tires, nests which may weigh hundreds of pounds.

Part of a flock of wild turkeys, which have increased in numbers through sound conservation measures, prance in a Wisconsin forest. Below, a rare albino and two normal white-tailed deer are startled by a photographer in the north woods.

The goal of this innovative education program is "environmental literacy." Laura Mae Brown, president of AAHPER, says, "An environmentally literate person recognizes the world system composed of people, culture and nature. He knows that man's activities alter the system to preserve or destroy man's environment."

There are already environmental study sites operating in 70 National Park Service areas in 29 states, the District of Columbia, Puerto Rico, and the Virgin Islands. They range from the beautiful wilderness of Rocky Mountain National Park to Philadelphia's historical Independence Hall to the Frederick Douglass home in Washington's inner-city.

With participation and promotion of the program by the 1.1-million member NEA, the Interior Department says it is hopeful that environmental study areas will spread to thousands of school districts — urban, suburban and rural — for delivery of environmental education to millions of students.

NOTE: The booklet, "Man and His Environment: An Introduction to Using Environmental Study Areas," may be purchased from the Publications-Sales Section, National Education Association, 1201 Sixteenth St., N. W., Washington, D. C. 20036. Stock No. 246-25118. Prices: Single copy, $1.75; 2-9 copies, 10 per cent discount; 10 or more copies, 20 per cent discount. All orders must be accompanied by payment unless on an authorized purchase order. Billed orders will have shipping and handling charges added.

Educators Eligible For Mediterranean Seminar

Rome, Athens, and a four-day cruise of the Greek Isles, will provide a new dimension to the nationally recognized University of Wisconsin Seminar in the Lands of the Bible (August 3-25, 1971) according to an announcement by its leaders Professor Menahem Mansoor, Chairman of the U.W. Department of Hebrew and Semitic Studies and Mr. H. Mike Hartoonian, Supervisor of Social Studies, Wisconsin Department of Public Instruction. This is the first time that the program will be held for three weeks only to enable more educators and clergymen to participate at a reduced cost.

The program has been extended to include two more cradles of western civilization so that participants might experience an introduction to and an understanding of the history, culture, geography, and archaeology of the Hebraic-Christian and Greco-Roman foundations of much of our own civilization. Participants may visit other Middle East and European countries without additional transportation costs.

The Seminar in the Lands of the Bible is a University of Wisconsin Study-Travel Program established by the Department of Hebrew and Semitic Studies in 1959 with the initial support of the Department of State's Educational and Cultural Exchange Program and the Office of Education. The program has been jointly sponsored by the University and the Department of Public Instruction since 1967. This year the group will leave from New York in August to visit Rome, Naples, and Pompeii and will then go to Athens. A four-day archaeological cruise of the Greek Isles, with an English-speaking guide, is included. In Israel the group will visit with Israeli, Arab, Druze and Christian leaders in addition to sightseeing, field trips to major cities and archaeological sites, and meetings with local inhabitants and their leaders. Since the general emphasis of the seminar is

area study and biblical archaeology, the program is of interest to college and high school teachers and clergymen, but others interested in biblical archaeology can also apply. University credits are available to qualified students. The Wisconsin Department of Public Instruction also recognizes the seminar as an academic improvement program for public school teachers in the state.

The number of participants will be limited to 35 to insure a close relationship between the group and the leaders.

The total cost, including transportation from New York, first-class accommodations, meals, four-day cruise, lectures, and sightseeing tours is estimated at $995.

For further information please write:

Professor Menahem Mansoor
Department of Hebrew and
Semitic Studies
University of Wisconsin
1346 Van Hise Hall
Madison, Wisconsin 53706
or
Mr. H. Mike Hartoonian
Supervisor of Social Studies
Department of Public Instruction
126 Langdon Street
Madison, Wisconsin 53702

Quarter Million Handicapped Receive Aid Through Federal Grants

Approximately 225,000 handicapped children throughout the country received special educational services during the 1968-69 school year through grants of more than $54 million provided by two Federal programs, HEW's Office of Education has reported.

In addition, 41,000 staff members in special education programs received inservice training and 16,500 new staff members were employed with these grants under the provisions of Public Law 89-313, an amendment to Title I of the Elementary and Secondary Education Act of 1965, and Title VI-A of the same Act.

The programs are administered by the Office of Education's Bureau of Education for the Handicapped, which has issued a report summarizing educational accomplishments under this legislation. *Better Education for Handicapped Children, Annual Report Fiscal Year 1969 — Aid to State and Local Schools* provides statistical details showing how Federal funds were used to supplement State and local programs to help provide a wide variety of services to handicapped children enrolled in public and residential schools of the 50 States, overseas areas, and the District of Columbia.

Wide Inclusion

The handicapped benefiting from these grants and services include mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, crippled or other health impaired children who require special education.

Dr. Edwin W. Martin, Associate Commissioner of the Bureau of Education for the Handicapped said, "While this report describes the significant impact made with funds provided under Public Law 89-313 and Title VI-A, the majority of handicapped children in the United States are still not receiving the special educational services they require. A shortage of special education personnel and facilities still exists, since only 38 percent

of the Nation's handicapped children are presently receiving any special educational services."

The report points out that the States are given considerable latitude in planning and implementing authorized special education activities. Among the various ways in which Federal grants were used, the report lists: employment and inservice training of teachers and teacher aides and other project staff members, preschool and work-study programs, parent counseling, diagnostic services, and houseparent workshops.

The report includes citations from many states showing how Public Law 89-313 and Title VI-A have made an affirmative impact on the education of handicapped children. For example:

- New York State reported that during 1969 special education for emotionally disturbed children made its greatest increase in local school districts in all the years of Federal funding, with 43 new projects serving handicapped children.
- Illinois reported that for the first time the State is providing preventive education by bringing projects for early identification of hearing impaired children into the local school districts.
- Florida is using some of its grant funds for a special playground where innovative evaluation techniques for education of physically and perceptually handicapped children are being developed.
- Oklahoma reports that the impact of the use of these funds prompted the State legislature to appropriate $200,000 in 1969 to enable local school districts to establish 40 new classes for the handicapped.
- North Dakota reported that pilot and innovative projects stimulated local agencies to become involved in helping children with special learning disabilities.

Additional information and a copy of the report can be obtained by writing the Bureau of Education for the Handicapped, Aid to States Branch, U.S. Office of Education, Washington, D.C. 20202.

A band composed of handicapped children in the Arkansas Children's Colony, at Conway, entertain at a parade. This phase of their musical education is made possible under a federal program administered by the Office of Education.

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'Closer Look' Campaign Aids The Handicapped

HEW's Office of Education is conducting a national campaign aimed at reaching and educating handicapped children at an early age.

More than 7,000 inquiries have been received from parents and others concerned with handicapped children since the "Closer Look" campaign was launched in August with the assistance of the Advertising Council. It is designed to help parents and guardians locate the necessary resources in their local communities to provide the aid needed by children with learning disabilities.

Spot announcements narrated by actress Anne Bancroft carry a message on television and radio throughout the nation asking viewers and listeners to take a closer look at their children, and to write to "Closer Look," Box 1492, Washington, D.C., to obtain information that will assist their children in overcoming learning handicaps.

"Closer Look"

To respond to requests for information addressed to "Closer Look," a national Special Education Information Center has been set up in Washington, D.C., to provide computerized information about facilities and special education programs for handicapped children.

Dr. Edwin W. Martin, Associate Commissioner of the Bureau of Education for the Handicapped said, "Since the inception of the program, thousands of parents have written to 'Closer Look,' to seek help for their handicapped children. Hundreds of teachers and principals of schools have also requested information on how to teach handicapped children. Social workers, occupational therapists, guidance counselors and psychologists have requested lists of institutions, programs and facilities for handicapped children. About two-thirds of parental letters reported that their children have more than one handicap, with the most frequent being: learning disabilities, emotional disturbance, speech impairments and mental retardation."

New Awards Made For Study Of Learning Process

HEW's Office of Education has announced $700,000 in new awards under a basic research program that is seeking the answers to questions about the learning process that have long puzzled educators as well as parents.

The Office's National Center for Educational Research and Development (NCERD) is providing support for 13 projects that concentrate on such diverse areas as the relationship between a child's ability to verbalize and his adjustment to the classroom, the influence of cultural background on memory, and the basic abilities required for understanding and creativity in the arts.

"The findings from these projects will add to a growing body of knowledge about learning that is of inestimable value in providing quality education for all children," says Dr. Glenn C. Boerrigter who heads NCERD's Division of Elementary and Secondary Education Research.

Researchers at the University of California at Los Angeles, for example, will study the influence of prenatal protein deprivation on brain development and learning. Using laboratory animals, they will investigate what effect impaired brain development, due to poor nutrition, may have on

succeeding generations. The research also will show whether special prenatal diets can bring about improved learning ability in the offspring.

Studies conducted by the National Bureau of Economic Research will address such questions as how formal education is translated into higher productivity; why it seems to yield greater economic gain for whites than nonwhites and nonwhite females than nonwhite males; and how various educational investments, such as teachers and classroom facilities, relate to later financial rewards.

A project at the University of Michigan will study 29 groups of students to evaluate areas of potential support and conflict between student characteristics and the expectations of large universities.

The Committee on Basic Research in Education, a special panel set up by the U.S. Office of Education, selected the 13 projects from among 66 proposals. The proposals were judged on the basis of their significance to education, economic efficiency, sound design, and the qualifications of the participating scientists.

Association For Childhood Education International Announces Conference

The theme, "Relating and Responding," with the focus on the adult, the curriculum and the child, will form the basis for discussion and deliberation at the forthcoming study conference of the Association for Childhood Education International.

Convening in Milwaukee on April 11, the week-long conference is expected to attract more than 2,500 educators and others vitally concerned with the education and well-being of children from ages 2 to 12. Developing aspects of the theme will be a.) general sessions, b.) assemblies and c.) discussion groups.

The first of three general sessions is entitled "Relating and Responding — the Adult" — conducted by Karl W. Deutsch, professor of government, Harvard, with speakers on the following subjects: The Adult's Many Roles; The Teacher as Innovator; The Teacher in the Community; Teacher Preparation and Problems of Beginning Teachers; Inservice Education of Teachers.

William Glasser, M.D., President of the Institute of Reality Therapy in Los Angeles, will moderate the second session, entitled "Relating and Responding — The Curriculum." Speakers will cover these topics: Past *vs.* Present in Curriculum; Critical Examination of the Reading World; The Need for Dialogue — Interaction *vs.* Listening and Absorbing; Involvement and Relevance — A Redefinition of Man; Cognitive and Affective Learning.

The third session, conducted by Robert S. Fleming, professor of education, Virginia Commonwealth University (Richmond), has for its theme "Relating and Responding — the Child." Participants will speak on: Children's Reactions to Teachers and Teaching; Parents as Teachers; Mass Media as Teacher; Children as Teachers.

Persons interested in attending the conference should write early to: Association for Childhood Education International, 3615 Wisconsin Ave., Washington, D. C. 20016 for further information and registration forms.

✓ Men will continue to commit atrocities so long as they believe absurdities.

— Voltaire

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Communications

New Book Published On College Entrance Questions

The College Entrance Examination Board has recently published *Free-Access Higher Education*, by Warren W. Willingham, a book that explores current and future aspects of providing equal opportunity in higher education.

According to the author there are three barriers facing students which may prevent them from getting into college. These are: lack of sufficient money, academic restrictions, and lack of colleges within commuting distance of their homes. Provided in this book is specific research data for each state about environmental factors of higher education, along with demographic information and a state map showing areas where free-access college education is available. National surveys are included. Copies may be obtained for $6.50 from the College Entrance Examination Board, Publications Order Office, Box 592, Princeton, N.J. 08540.

Wisconsin History On Television

"When Our State Was Young," a series of programs on Wisconsin history, is being presented by WHA-TV School of the Air, Madison Channel 21 on Tuesdays at 1:40 p.m. and Wednesdays at 10:40 a.m. Schools in the Green Bay and Duluth-Superior viewing areas are also able to take advantage of this series. See local papers for times.

Booklet on Caddy Woodlawn

Caddy Woodlawn, heroine of a timeless children's classic set in old Wisconsin, is the subject of a new publication of the Dunn County Historical Society entitled *Caddie Woodlawn: A Pioneer Girl on Wisconsin's Frontier*, and edited by John M. Russell. The booklet contains information about the Woodlawns, Dunnville, and writer Carol Ryrie Brink. Copies are available for 50¢ plus 15¢ postage and handling from John M. Russell, Box 9, Menomonie, Wisconsin 53706.

Multi-Media Kit Promotes Adult Education

A multi-media "campaign in a box" that helped increase the number of functionally illiterate persons signing up for adult basic education classes in Appalachia this year is now being made available to other educators throughout the Nation.

Developed under a special grant from HEW's Office of Education, the unique enrollment promotion kit was produced by the Appalachian Adult Basic Education Demonstration Center at Morehead State University in Kentucky. The Center is funded under the Adult Education Act.

The Center has made available nearly 400 of these kits to school districts throughout the Appalachian areas of 13 States for adaptation and placement with newspapers, radio and television stations, magazines, and other local channels of communication.

Neatly packaged in a box, the cam-

paign consists of public service announcements on audio tapes, records, and video tapes and printed material, including news releases, posters, billboard messages, and promotional letters to agencies and civic groups.

Designed to serve primarily as a working tool, the kit also demonstrates the effectiveness of planned mass-communication media in adult basic education recruitment.

Kits have been sent to the State directors of Adult Education in the 50 States as a suggested model for use by school districts in their own areas.

Textbook Sales Thrive

While many educators are de-emphasizing dependence on textbooks, the Association of American Publishers, Inc. reports a record year in 1969 both for elementary and secondary, and for college textbook sales. However, as expected, some of the bloom has come off the market as the post-war baby boom fades into history; and sales are increasing at a decreasing rate. The chart reflects recent trends.

Troubled Waters In Old Nippon

The Japanese newspaper *Mainichi Shimbun* has discovered that polluted river water can be used to develop photographs. A recent issue of the paper printed a photograph developed not with chemical developer but with water collected from rivers, ditches and canals near Mt. Fuji. The resulting photo was fuzzy but recognizable. Onward and upward with technology.

"You dropped my Nikon into the crick and **what** happened?"

TOTAL TEXTBOOK SALES BY PUBLISHERS (DOLLAR NET SALES)

Thousands of dollars (add three zeros)

Year	Elementary	High School	El-Hi	College	Total
1960	148,400	82,500	230,900	106,900	337,800
1961	158,000	93,800	251,800	121,650	373,450
1962	165,950	105,350	271,300	138,400	409,700
1963	183,950	120,750	304,700	160,200	464,900
1964	201,100	124,950	326,050	188,800	514,850
1965	225,950	138,050	364,000	223,300	587,300
1966	279,900	161,300	441,200	270,300	711,500
1967	265,550	155,250	420,800	286,500	707,300
1968	281,200	162,800	444,000	322,450	766,450
1969	281,850	169,650	451,500	345,850	797,350

SNOWY OWL

RED FOX; COYOTE AND FRIEND

HERRING GULLS ON LAKE SUPERIOR

LETTERS TO THE EDITOR

October Issue

I am not sure if history is relevant, but the October **Newsletter** is relevant to my course [in] the teaching of social studies. Would it be possible to receive 14 additional copies for use by my students?

John H. McDonnell, Chairman
Department of Education
Beloit College

* * * *

. . . The articles were very relevant to some of the problems which we are presently experiencing in the area of social studies.

Keith Wunrow
Director of Instruction
Hamilton Joint
School District #17
Sussex, Wis.

* * * *

This is a fine publication, which I enjoyed reading — most stimulating. Keep up the good work.

Robert M. Utley
Chief Historian
National Park Service
Washington, D.C.

* * * *

Thanks for sight of the magazine, which I gandered through — at last! for I've been flooded with mail . . . . I've passed it on to our local schools.

August Derleth
Sauk City, Wis.

* * * *

Keep up the excellent work on the **Newsletter.** I look forward each month to reading it.

Charles R. Misky, Principal
West Grant High School
Patch Grove, Wis.

* * * *

ANSWER TO LAST MONTH'S RIDDLE

In last month's issue readers were invited to identify these two "difficult" students who later gained world fame. While many correspondents correctly identified the boy as Thomas A. Edison, only one, Miss Estelle Richter, a kindergarten teacher at F. D. Roosevelt School in Green Bay, spotted the young lady (shown in a miniature portrait by Bastien Lepage) as the celebrated actress Sarah Bernhardt.

Guesses about the boy's identity included Herbert Hoover, Winston Churchill and Wernher von Braun. So far as the girl was concerned, four readers said Helen Keller, one said Maggie Sullivan, Miss Keller's teacher; others guessed Eleanor Roosevelt, Susan B. Anthony and Madame Curie. One correspondent pronounced that she was "Newton." (*Isaac*?)

Honorable mention for the most imaginative answer goes to Professor Joan Whitehead at the University of Virginia, who wrote: "The boy is either young Tom Edison or Mickey Rooney (saw the movie) and the girl is Barbra Streisand tricked out in a fright wig."

Our regrets, Mrs. Whitehead. You'll just have to make do without that free copy of the Wisconsin *Blue Book*.

Calendar

December 1970

13-18 White House Conference on Children, Washington, D.C.
15-19 Midwest National Band Clinic, Chicago

January 1971

8-9 State Music Convention, Madison
21 Central Wisconsin Association for Supervision and Curriculum Development, Holiday Inn, Stevens Point
23-27 National Association of Secondary School Principals Meeting, Houston, Texas
26 Northwest Wisconsin Association for Supervision and Curriculum Development, Lehman's Supper Club, Rice Lake
27-29 WASB-WSBD-WASDA Convention in Milwaukee Auditorium

A NOTE TO READERS

- Letters to the editor are welcomed and will be printed in whole or in part, as space permits.
- Limited extra copies of any issue of NEWSLETTER are available on request.

Gibraltar Rock, Columbia County